

WHAT IS CLAIMED IS:

1. A method for producing polymer/silicate nanocomposites via emulsion polymerization, which comprises the steps of:

5 (a) forming initial particles from a layered silicate and a monomer provided for high molecular weight polymerization using a reactive emulsifying agent containing a functional group having affinity for the layered silicate; and

10 (b) emulsion polymerizing the initial particles from the step (a) and a monomer additionally provided using a stabilizer to form exfoliated polymer/silicate nanocomposites.

15 2. The method according to claim 1, wherein the layered silicates have an average interlamellar spacing in the range of 7 to 12 Å.

20 3. The method according to claim 1, wherein the layered silicates comprises at least one selected from the group consisting of montmorillonite, hectorite, saponite and fluorohectorite.

25 4. The method according to claim 1, wherein the initiator for emulsion polymerization comprises at least one selected from the group consisting of ammonium sulphate, potassium sulphate, azobisisobutyronitrile, cumene hydroperoxide and

benzyloxide.

5. The method according to claim 1, wherein the monomers comprises styrenes or styrene copolymers.

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6. The method according to claim 1, wherein the reactive emulsifying agent includes a vinyl group for mediating the polymerization.

7. The method according to claim 1 or 6, wherein the reactive emulsifying agent includes at least one selected from the group consisting of an amide group and sulfone group.

8. The method according to claim 7, wherein the reactive emulsifying agent comprises at least one selected from the group consisting of 2-acrylamido-2-methyl-1-propane sulfonic acid(hereinafter referred to as AMPS),

(3-acrylamidopropyl)trimethylammonium chloride,

[2-(acryloyloxy)ethyl]trimethylammonium methyl sulfate,

vinylbenzyltrimethylammonium chloride,

3-acrylamido-3-methylbutyltrimethylammonium chloride,

N,N-dialkylaminoethylacrylate,

N,N-dialkylaminoethylmethacrylate,

N,N-dimethylaminoethylacrylate,

N,N-dialkylaminoethylmethacrylate,

N,N-dimethylaminoethylacrylate,  
N,N-dimethylaminoethylmethacrylate,  
N,N-dimethylaminomethylacrylamide,  
N,N-dimethylaminopropylmethacrylamide, and  
5 2-methacrylamidopropyltrimethylammonium chloride.

9. The method according to claim 1, wherein the stabilizer comprises at least one selected from the group consisting of anionic emulsifying agents such as linear alkylbenzenesulfonate compounds in which the main chain comprises alkyl group or ethylene oxide, nonionic emulsifying agents, rosin soaps, and fat soaps.

10. The method according to claim 5, wherein the styrene copolymers comprises copolymers of styrene with at least one selected from the group consisting of methylmethacrylate, butylacrylate, butadiene, isobutylacrylate, isoprene and hydroxyethylmethacrylate.

11. The method according to claim 9, wherein the anionic emulsifying agent comprises at least one selected from the group consisting of sodium dodecylbenzenesulfonic acid, sodium laurylic acid, sodium decylsulfonic acid, sodium dodecylsulfonic acid and rosin.

12. The method according to claim 9, wherein the nonionic emulsifying agent comprises at least one selected from the group consisting of N-triethoxylated nonaneamides, decylmethysulfoxide and  $\beta$ -dodecylmaltocides.

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